



e-ISSN: 2722-3787

Tomini Journal of Aquatic Science

Homepage: <http://ejurnal.ung.ac.id/index.php/tjas>



Octolasmic *Octolasmis* spp. parasite attack on mud crab *Scylla serrata* in Tomini Bay

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ARTICLE INFO

Keywords:

Ectoparasite, Intensity, Mud Crab, *Octolasmis* spp., Prevalence

How to cite:

Suherman, S.P., Marjan, Rahmatiya & Lamadi A. (2022). Octolasmic *Octolasmis* sp. parasite attack on mud crab *Scylla serrata* in Tomini Bay. *Tomini Journal of Aquatic Science*, 3(2), 61-67

ABSTRACT

This study aims to identify *Octolasmis* spp. intensity and prevalence of ectoparasites in mud crabs in Pohuwato Regency. The method used is survey method and location observation with mangrove crab sampling technique, examination of ectoparasites seen on the gills and the intensity and prevalence of parasites are calculated. The study was conducted in three different locations in Pohuwato district: location 1 (East Pohuwato Village), location II (Bulili Village), and location III (Mootilango Village). The results showed that the parasites that infested mangrove crabs in three separate locations were *Octolasmis angulata* and *Octolasmis cor*. The highest intensity rate occurred at location III which was dominated by *Octolasmis cast*. The prevalence of parasites at locations I, II, and III were 60%, 40%, and 60%, respectively. In addition, the parasite had a prevalence of 100% and 46% in female and male crabs, respectively. Air quality indicators (including temperature, pH level, and dissolved oxygen) are at appropriate levels for mud crab culture.



INTRODUCTION

Indonesia as the largest archipelagic country in the world has two-thirds of its territory in the form of Indonesian seas, namely 6.32 km², 17,504 islands, and is one of the countries that has the second longest coastline in the world after Canada, which is 99,093 km². With this, the territory of Indonesia has a very large potential in the field of fisheries. The fisheries sector in Indonesia is aquaculture, capture fisheries, and fisheries processing (Soemarmi & Diamantina, 2019)

One of them is in the field of aquaculture, where aquaculture itself is defined as an activity to produce aquatic biota (organisms) in a controlled manner in order to gain profit. There are many types of aquaculture, namely freshwater aquaculture, brackish water aquaculture, and seawater aquaculture. One of them is brackish water cultivation where one of the commodities is Mud Crab (Effendi, 2004).

Irvansyah et al. (2012) stated that mud crab (*Scylla serrata*) is a fishery commodity that lives in coastal waters, especially in mangrove forests and has high economic value. The increasing consumer demand for crabs from foreign markets has resulted in the need for a balance with increasing mangrove crab cultivation (Wardhani et al., 2018).

However, currently, the provision of seeds for mud crab cultivation still relies on natural catches. Mangrove crab seeds caught by nature are still at risk of disease, because of the environmental conditions in which the mangrove crabs live. Diseases that attack mud crabs can be caused by viruses, bacteria, and parasites. Parasites that are often found in crabs are included in the type of ectoparasites, one of which is *Octolasmis* spp. (Irvansya et al., 2012). This study aims not only to find information on the attack rate of *Octolasmis* spp. in Tomini Bay, but also to identify octolasmis species that specifically attack mud crabs.

MATERIAL AND METHODS

Study site. The sample was taken in the mangrove area in Tomini Bay, precisely from three locations in Pohuwato Regency, namely East Pohuwato Village, Bulili Village, and Mootilango Village.

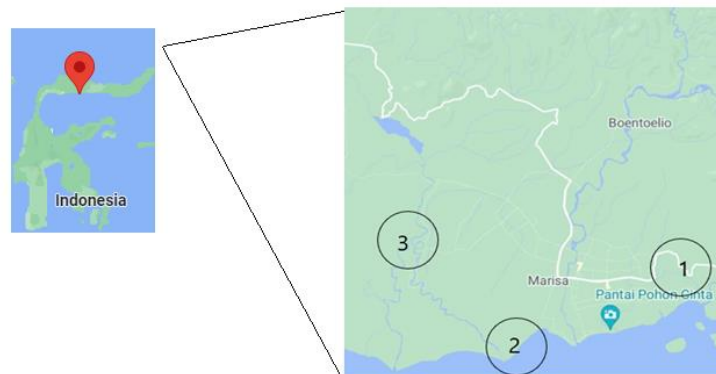


Figure 1. Map of Mangrove Crab Sampling Locations. 1. East Pohuwato Village, 2. Bulili Village, and 3. Mootilango Village.

Method. The research method used is a survey method with sampling techniques on mud crabs (*Scylla serrata*). The data collection method that will be used is the field observation method which will be carried out in Pohuwato Regency

Data analysis. The level of parasite presence was analyzed descriptively by using pictures based on intensity and prevalence referring to Williams et al., 1996 and Schmidt, 2008. Morphological identification of the parasite *Octolasmis* spp. The obtained characteristics were analyzed using the method of (Jeffries et al., 2005).

RESULTS AND DISCUSSION

Based on the results of identification research *Octolasmis* spp. on mangrove crabs in Pohuwato Regency with three locations, the results showed that these mangrove crabs were attacked by the parasites *Octolasmis angulata* and *Octolasmis cor*

1. *Octolasmis angulata*

The results obtained were proven by the number of scutum, tergum, and carina branches in the *Octolasmis* spp. for *O. angulata* has 2 scutum branches and 1 carina with a slightly tapered scutum tip. With the results obtained according to Jeffries et al., (2005) that *O. angulata* has 2 scutum branches and 1 carina with a slightly tapered tip of the scutum branch.

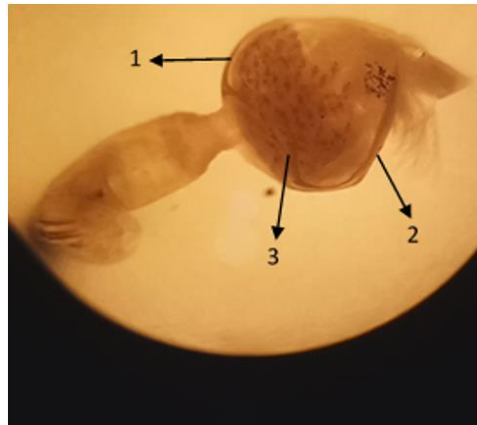


Figure 2. *O.angulata*. 1. Scutum 2. Carina 3. Scutum with slightly tapered ends

2. *Octolasmis cor*

The results obtained were proven by the number of scutum, tergum, and carina branches in the *Octolasmis* spp. for *O. cor* has 2 scutum branches and 1 carina as well as *O. angulata* but with a different shape of the tip of the scutum branch is slightly wider. With the results obtained according to (Jeffries et al., 2005) that *Octolasmis cor* has 2 scutum branches and 1 carina as well as *O. angulata* but with a slightly widened tip of the scutum branch.

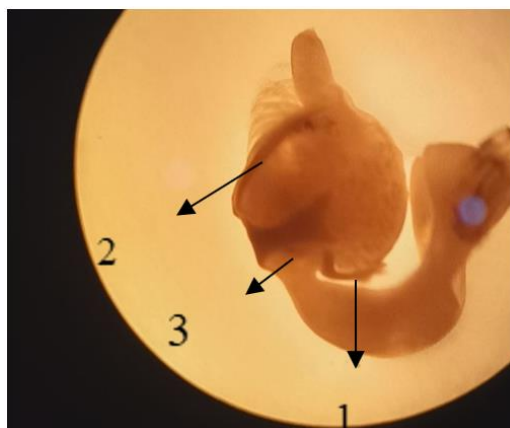


Figure 3. *O.angulata*. 1. Scutum 2. Carina 3. Scutum with slightly tapered ends

The intensity of *Octolasmis* spp.

Based on the research results obtained by identifying the parasite *Octolasmis* spp. the mud crabs had the highest intensity of parasitic attack in Mootilango Village with an intensity level of 30 ind/head, then East Pohuwato Village with 23 ind/head and the lowest in Bulili village with 13 ind/head. High parasite intensity can affect mud crabs because it will increase the surface area of the gills covered by this parasite. If the surface area of the gills is wider, the *Octolasmis* parasite will get more places to live in the gills of the mud crab



Figure 4. Octolasmic Intensity by location

Intensity of Octolasmis Spp. By Male and Female

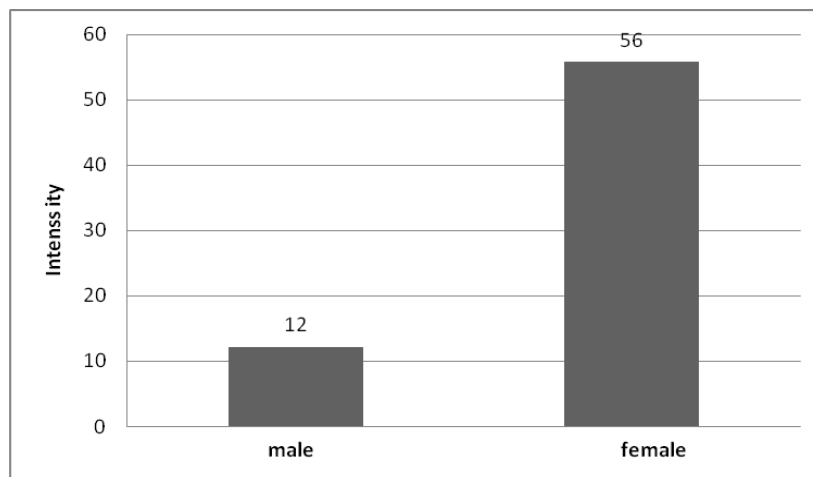


Figure 5. Octolasmic Intensity on mud crabs by gender

With this (**figure 5**), it can be seen that female mud crabs have a higher intensity and prevalence than male mud crabs, this is presumably due to the respiration process of the crabs. According to (Villarreal et al., 2003) that oxygen consumption in crustaceans is influenced by two factors, namely internal factors and external factors. External factors that influence are salinity, dissolved oxygen concentration, temperature, light, food status and carbon dioxide. Internal factors are species, stadia, weight, activity, reproduction, molting and gender. This is thought to cause female mud crabs to carry out the process of respiration more often than male mud crabs so that female mud crabs provide more food or nutrients needed by the parasite *Octolasmis* spp. It is known that the parasite *Octolasmis* spp. obtain nutrients from filtering food in the form of plankton and detritus which are food for the parasite *Octolasmis* spp. obtained from the respiration process carried out by mud crabs.

The prevalence of *Octolasmis* spp.

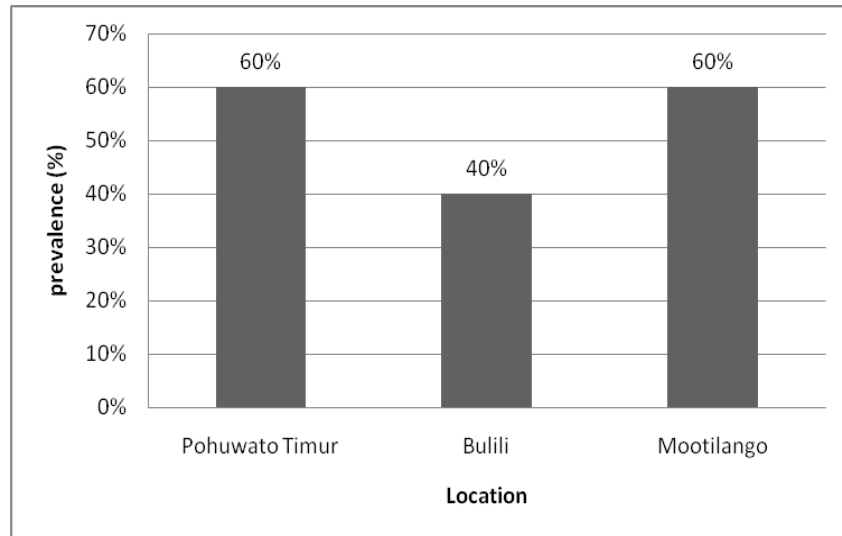


Figure 6. Octolasmic Prevalence on mud crabs

Based on the results (**figure 6**), the highest prevalence rate was found in Mootilango Village and East Pohuwato Village with 60% and the lowest was in Bulili Village with 40%. The prevalence of *Octolasmis* spp. This is included in the moderate prevalence category because it has a prevalence rate of 30-65% where this parasite can cause stress, but there will be no death in the host (Schmidt et al., 1992) This difference in prevalence is thought to be the concentration of organic matter content in each region (**Table 1**).

Prevalence of *Octolasmis* Spp. By Gender

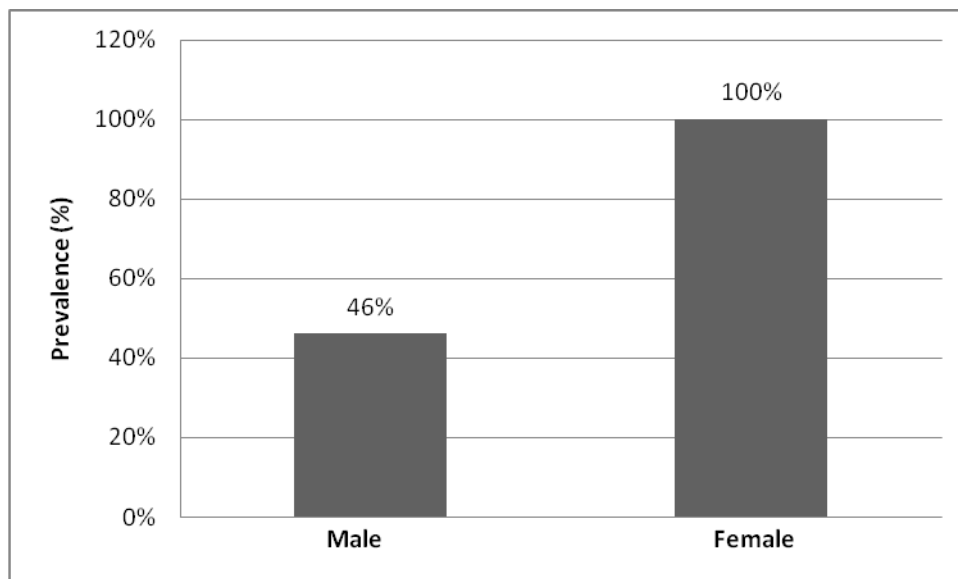


Figure 7. Octolasmic Prevalence on mud crabs by gender

The prevalence of female mud crabs is 100% due to the data obtained that of the 4 female mud crabs all of them were infected by the parasite *Octolasmis* spp. However, the prevalence

of male mangrove crabs was 46% due to the data obtained that from 26 male mangrove crabs only 12 mangrove crabs were infected with the *Octolasmis* spp parasite.

The prevalence of *Octolasmis* spp. This male mud crab is categorized as moderate prevalence because it has a prevalence rate of 30-65% where this parasite can cause stress, but there will be no death of the host. While the prevalence of *Octolasmis* spp. The female mud crab is included in the high prevalence category because it has a prevalence rate that reaches 100% where this parasite can cause stress to the death of the host (Schmidt et al., 1992).

Water quality

The water quality data used as supporting research parameters include temperature, dissolved oxygen, pH, and BOD. Below are the results of the water quality data measured during the study:

Table 1. water quality of three crab fishing stations

Station	Water quality			
	pH	Temp (°C)	DO (mg/L)	BOD (mg/L)
Pohuwato east Village	7.74	31.2	4.37	4.4
Bulili Village	7.86	32.7	4.46	1.6
Mootilango Village	7.58	34.9	3.57	14.8

The water quality measured in each village obtained the results of temperature, pH, and DO which were still in the appropriate range where the temperature was still around 23 – 32°C, pH 7.9 – 8.3 and DO < 4 mg/L. The highest BOD was in Mootilango Village at 14.8 mg/L, then in Pohuwato Timur Village at 4.4 mg/L and the lowest in Bulili Village at 1.6 mg/L. According to (Irvansyah et al., 2012), found that the trigger for the high attack of ectoparasites on crabs was caused by the environmental conditions of cultivation with high stocking density accompanied by decreased water quality. (Rosmaniar, 2008), stated that excessive BOD content will affect the decrease in dissolved oxygen in the waters and have a direct impact on increasing COD. According to Effendi (2003) waters that have a BOD value of more than 10 mg/L are considered polluted. With this, the high BOD causes the water quality to decrease so that it is possible for crabs to be attacked by ectoparasites.

CONCLUSION

The conclusion that can be drawn from this study is that there are two species of octolasmis parasites that attack mud crabs, namely *Octolasmis angulata* and *Octolasmis cast*. *Octolasmis* spp., the highest level of intensity and prevalence of ectoparasites was found in Mootilango Village with an intensity of 30 ind/head and 60% and the highest attack on female mud crabs with an intensity of 56 ind/head.

ACKNOWLEDGEMENT

A big thank you is conveyed to the laboratory of the Faculty of Fisheries and Marine Science, State University of Gorontalo

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